Recension of the genus *Fendlerella* (Hydrangeaceae)

Billie L. Turner
Plant Resources Center, The University of Texas, Austin, TX 78712, billie@uts.cc.utexas.edu

ABSTRACT

The basic taxonomy of *Fendlerella* is reviewed. The genus is comprised of four species: *F. utahensis*, with two allopatric, intergrading varieties, var. *utahensis,* of western USA, and var. *cymosa*, of southwestern USA and northern Mexico; *F. lasiopetala*, of north-central Mexico; *F. mexicana* of Pueblo, Mexico; and the newly described **F. queretarana** B.L. Turner, **sp. nov.**, from the state of Queretaro, Mexico. A key to the taxa is provided, along with maps showing their distribution. Published on-line **www.phytologia.org** *Phytologia 95(4): 308-313 (Nov. 1, 2013).* ISSN 030319430

KEY WORDS: Hydrangeaceae, *Fendlerella, F. utahensis, F. lasiopetala, F. mexicana, Fendlera, Whipplea*

The genus *Fendlerella* was erected by Heller in 1898 with the description of *F. utahensis* from collections made by Mrs. E. P. Thompson in Kanab, Kane Co., Utah, in the year 1872. The taxon was originally described as belonging to the genus *Whipplea*, but Heller aptly remarked, "That this plant is not a *Whipplea* is evident, neither does it agree much better with the genus *Fendlera*, with its large usually solitary flowers, tetramerous, and its ovoid capsule, which is attached to the calyx tube only at the base." Indeed, *Whipplea*, *Fendlera* and *Fendlerella* form a closely related triad within the Hydrangeaceae, which is well supported by morphological and DNA studies (Soltis, D.E., Q. Xiang and Hufford, 1995; Turner, 2001).

Subsequent workers added to *Fendlerella* the species, *F. cymosa* Greene ex Woot. & Standl. (1913), this reduced to a variety of *F. utahensis* by Kearney & Peebles. Three Mexican species were subsequently described, *F. mexicana* Brandegee (in 1908); *F. lasiopetala* Standl. (in 1920); and the newly described *F. queretarana* B.L. Turner, below.

The following is a Key to the closely related genera *Whipplea*, *Fendlera* and *Fendlerella*, as abstracted from Small and Rydberg (1916):

1. Capsule spheroidal; style deciduous, the capsule beakless.....**Whipplea**
1. Capsule conic to ovoid; style persistent, the capsule beaked...(**2**)

2. Sepals and petals 5; anthers w/o appendages.....**Fendlerella**
2. Sepals and petals 4; anthers with apical appendages.....**Fendlera**

WHIPPLEA Torr.

The genus contains but a single species, *W. modesta* Torr., largely confined to the Pacific Northwest (California, Oregon, Washington).

FENDLERA Engelm. & Gray

The genus contains five species, as treated by Turner (2001).

FENDLERELLA Heller

Divaricately, much-branched shrubs 0.4-1.0 m high. Stems woody, strigose, the internodes much shortened. Leaves, simple, elliptic, lanceolate to oblanceolate, margins entire, often revolute, mostly 1-2

cm long, markedly strigose or not, the undersurfaces variously pubescent, 3-nervate. Flowers, inconspicuous, arranged in terminal cymose clusters. Petals small, linear to oblanceolate, white, glabrous or pubescent. Hypanthium, turbinate, ca 1.5 mm high. Capsule ca twice as long as the calyx. Base chromosome number, x = 13.

As treated here, a genus of four species, one of these possessing two varieties, as follows:

Key to taxa

1. Leaves sparsely pubescent, not at all bicolored.....**F. utahensis**
1. Leaves densely pubescent above and below, markedly bicolored; plants of Mexico...(**2**)

2. Undersurfaces of leaves with a single layer of appressed, straight hairs; Que.....**F. queretarana**
2. Undersurfaces of leaves pubescent with two layers, a dense lower level of crinkly hairs and an upper layer of appressed, straight hairs; Coa, Nue, Pue…(**3**)

3. Upper surface of petiole markedly tufted with hairs 2-3 mm long; leaves weakly 3-nerved beneath ; petals glabrous; hypanthium weakly pubescent; Pue……..……..…**F. mexicana**
3. Upper surface of petiole weakly tufted with hairs ca 1 mm long; leaves strongly 3-nervate beneath throughout; petals usually pubescent; hypanthium markedly pubescent……...……...**F. lasiopetala**

FENDLERELLA LASIOPETALA Standl., Proc. Biol. Soc. Washington 33: 67. 1920.
TYPE: **MEXICO. COAHUILA**: San Lorenzo Canyon, SE of Saltillo, 16 Apr 1905, *E. Palmer 635* (Holotype: US).

Coa and Nue, calcareous or gypsum substrates, 1200-2200 m; flowering: Jul-Oct. **Fig. 2**
Shrubs or shrublets, 0.4-1.0 m high; stems woody, the internodes much shortened; leaves ovate to ovate-lanceolate, mostly 1.0-1.5 cm long, 0.3-0.6 cm wide, more or less bicolored, pubescent above with appressed, straight, basally enlarged hairs, below with an upper array of linear, appressed, hairs, beneath this a dense cottony layer of crinkly hairs; petals linear, white, 2-3 mm long, glabrous or pubescent with elongate white hairs; hypanthium pubescent, the lobes ca 1 mm long.

According to its author, this taxon differs from most other species in the genus in having pubescent petals, but that is a variable character, plants from the same population may possess glabrous or pubescent petals, some of these more so, some less so.

The species is represented by numerous collections at LL-TEX (Fig. 2).

FENDLERELLA MEXICANA Brandegee, Zoe 5: 246. 1908.
TYPE: **MEXICO. PUEBLA:** vicinity of San Luis Tultitlanapa, "Rocky slopes. Cerro de Paxtle." July 1907, *C. A. Purpus 2588* (Holotype: UC; isotype: MO!).

Pue, mostly calcareous substrates, 1600-2600 m; flowering: Feb-Jun. **Fig. 2**
Sub-shrubs to 1 m (?) high. **Leaves** opposite throughout, markedly bicolored; petioles 1-2 mm long, their upper surfaces markedly pubescent with tufted hairs 2-3 mm long; blades mostly elliptic to ovoid, 8-20 mm long, 3-8 mm wide, weakly 3-nerved beneath, the upper surfaces moderately pubescent with appressed hairs, the lower surfaces with an upper layer of elongate hairs, beneath these an understory of cottony, densely congested, crinkly, hairs. **Cymes** dense, terminal, ca 1.5 cm long, and as wide. **Hypanthium** turbinate, ca 2 mm long, sparsely pubescent; lobes ca 1 mm long. **Petals** white or cream, spatulate, 3-4 mm long, 1-2 mm wide, glabrous. **Capsules** 2-loculate, turbinate, ca 3 mm long, 1 mm wide.

This species is known to me only by the type, the above description largely taken from an isotype at MO.

Perez-Calix (2004) treated material from Queretaro as belonging to this taxon, but I treat such plants as constituting the newly described *F. queretarana*, below; *F. mexicana*, in addition to the pubescence mentioned in the above key, has more pronounced petals, and more prominently tufted petioles, not to mention its geographical disjunction.

FENDLERELLA QUERETARANA B.L. Turner, **sp. nov. Fig. 1**

n Que, calcareous soils, oak and *Juniperus-Pinus cembroides* woodlands, 1650-2600 m; Feb-Jun.

Resembling *Fendlerella mexicana* but the under surfaces of leaves pubescent with but a single layer of elongate hairs (vs 2-layered), the petals smaller (1-2 mm long, vs 2-3 mm), and the tuft of hairs at the base of petiole shorter, less pronounced (hairs ca 1 mm long, vs 2 mm).

Shrubs or shrublets, 0.5-1.0 m high. **Leaves** lanceolate, 1-2 cm long, weakly bicolored, 3-nervate beneath, if at all, the upper surfaces moderately appressed-pubescent with broad-based white hairs ca 1 mm long, lower surfaces more densely pubescent with a single layer of longer hairs ca 2 mm long; apices acute-apiculate; petioles with a basal tuft of axillary hairs ca 1 mm long. **Cymes** 10-20 flowered, arranged in terminal, aggregations, 5 mm high, ca 10 mm across. **Hypanthium,** ca 1 mm high, sparsely pubescent; sepals ovate, ca 1 mm long; petals white, linear, glabrous, 1-2 mm long, ca 1 mm wide. **Capsules** 2-loculate, ca 3 mm long. Seeds not observed.

TYPE: **MEXICO. QUERETARO: Mpio. Pinal de Amoles,** "1-2 km al N del Puerto del Tejamanil," pine-oak woodlands, 2480 m, 11 Jun 1991, *E. Carranza 3187* (Holotype: TEX).

The above description was largely taken from type material. Perez-Calix (2004), in his treatment of *F. mexicana* for the Flora de Bajio, provides a more enlarged description, this based upon11 sheets from 3 additional Municipios of Queretaro, these included in my Fig. 2.

FENDLERELLA UTAHENSIS (S. Wats.) Heller, Bull. Torrey Bot. Club 25: 626. 1898.
Fendleria utahensis Greene
Whipplea utahensis S. Wats.

As treated here, two geomorphological population systems are recognized (Fig. 3); occasional plants from one or the other complex will have intermediate characters, hence their treatment as varieties.

Key to varieties

1. Larger leaves mostly lanceolate to narrowly oblanceolate, 1.5-2.0 cm long, having apices narrowly acute.....var. **cymosa**
1. Larger leaves mostly ovate to obovate, 0.8-1.5 cm long, having apices broadly acute to obtuse, or rounded.....var. **utahensis**

var. **utahensis**
TYPE: **USA. Utah: Kane Co.,** Kanab on "dry rocky cliffs; July, August." *E.T. Thompson s.n.,* probably in 1872 (Holotype GH).

This taxon is well described by numerous authors (e.g., Welsh et al., 1987) and need not be elaborated upon here. It is widely distributed in the western USA (**Fig. 3).**

var. **cymosa** (Greene) Kearney & Peebles, J. Wash. Acad. Sci. 29: 480. 1939.

Fendlerella cymosa Greene
TYPE: **USA. ARIZONA: Cochise Co.:** Huachuca Mts., 7 Jul 1884, *Pringle 699* (Holotype: US).

The var. *cymosa* is largely restricted to limestone boulders and rocky ledges in the southwestern USA. In Mexico it mostly occurs on calcareous or gypsum slopes in pine woodlands. Leaf size and shape is very variable in the collections from Nuevo Leon, Mexico, encompassing the range of leaf shapes and sizes found in both varieties of the species elsewhere. **Fig. 3**

The taxon was well described by Greene in his original description and by subsequent authors, and such need not be reiterated here.

Vines (1960) provided an excellent description and sketch, commenting that the taxon "has been named the Arizona Fendlerella" and correctly noted that it has narrower and more pointed leaves than the typical variety.

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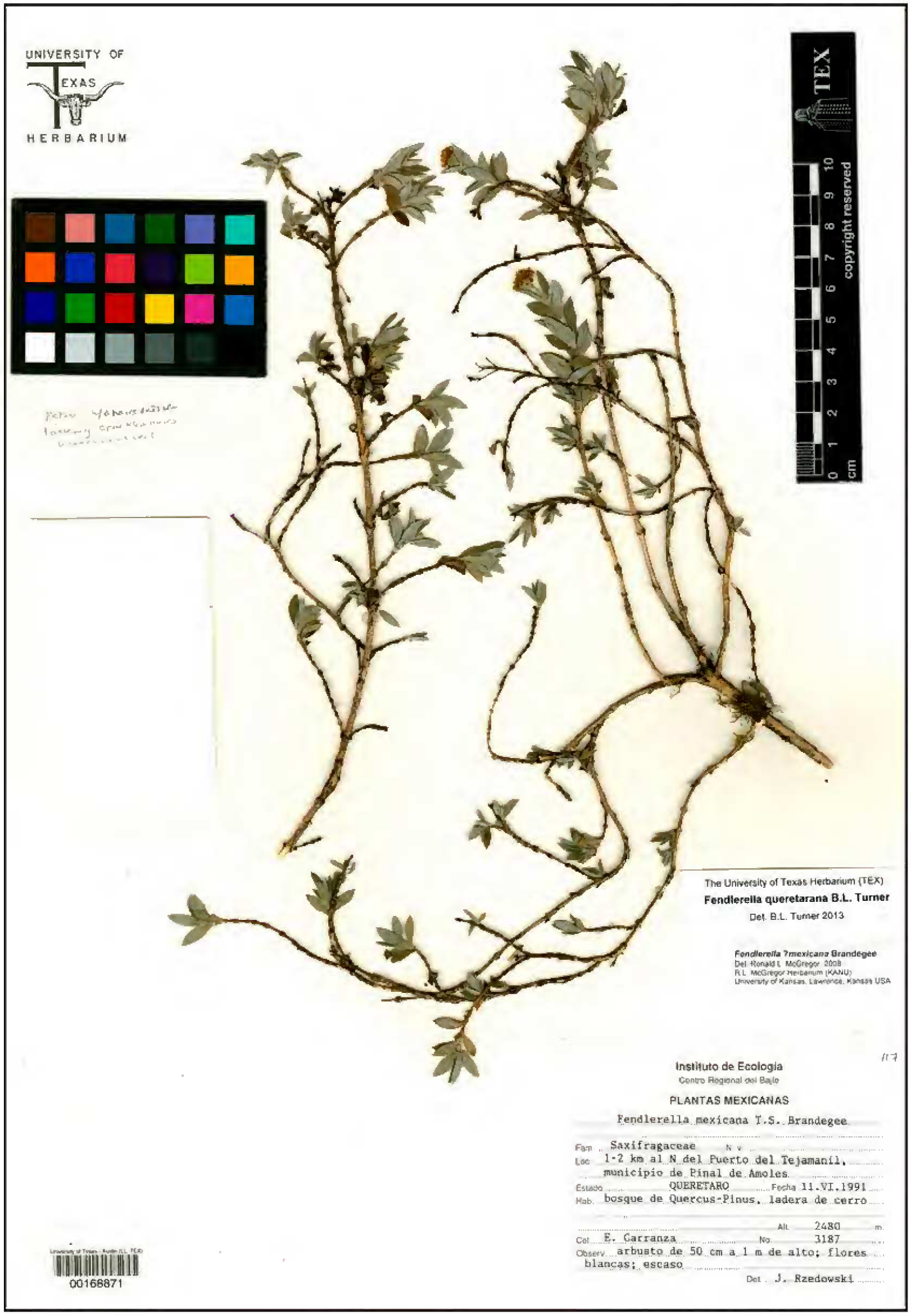

Fig. 1. *Fendlerella queretarana* (Holotype: TEX)

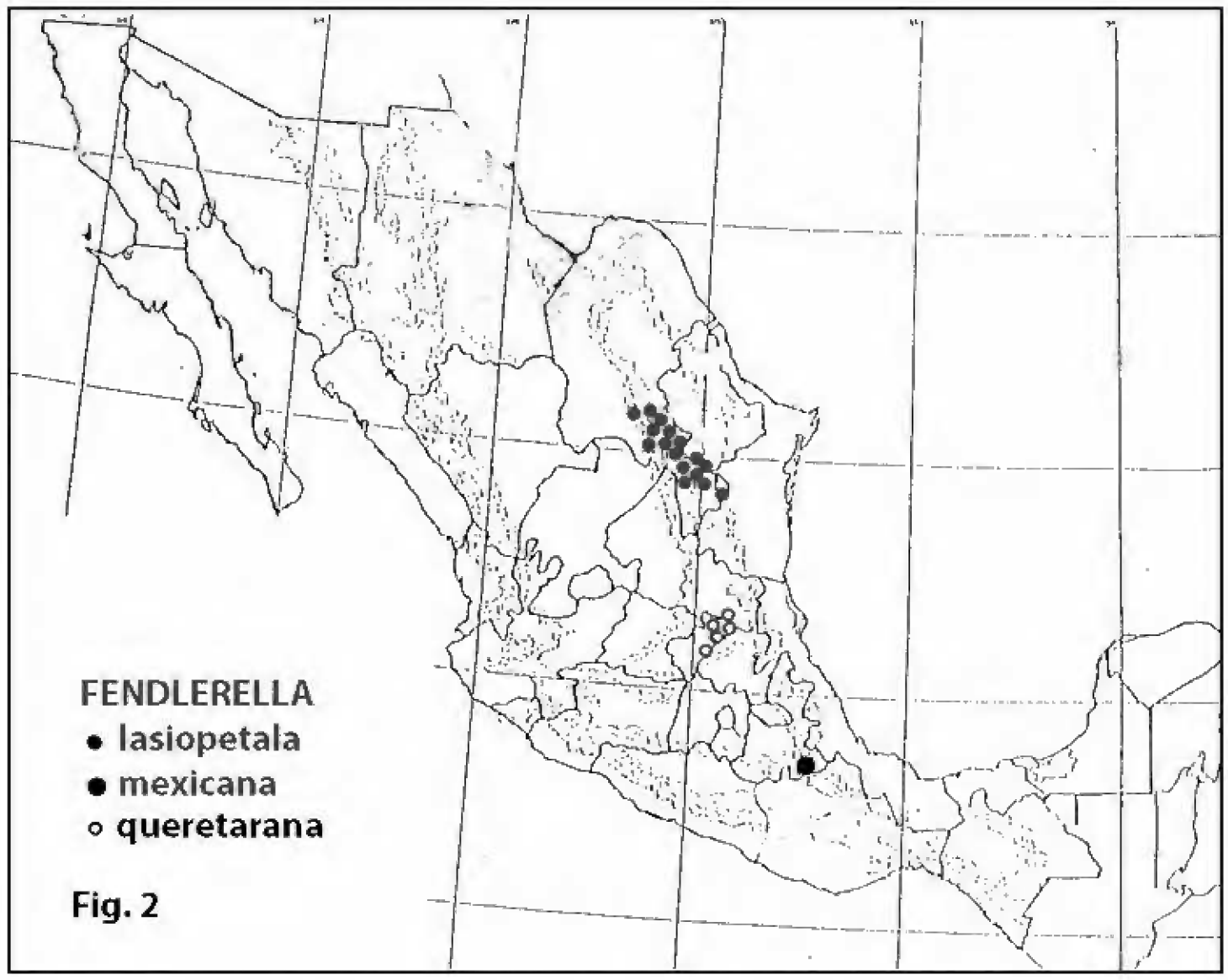

Fig. 2. Distribution of *Fendlerella* spp.

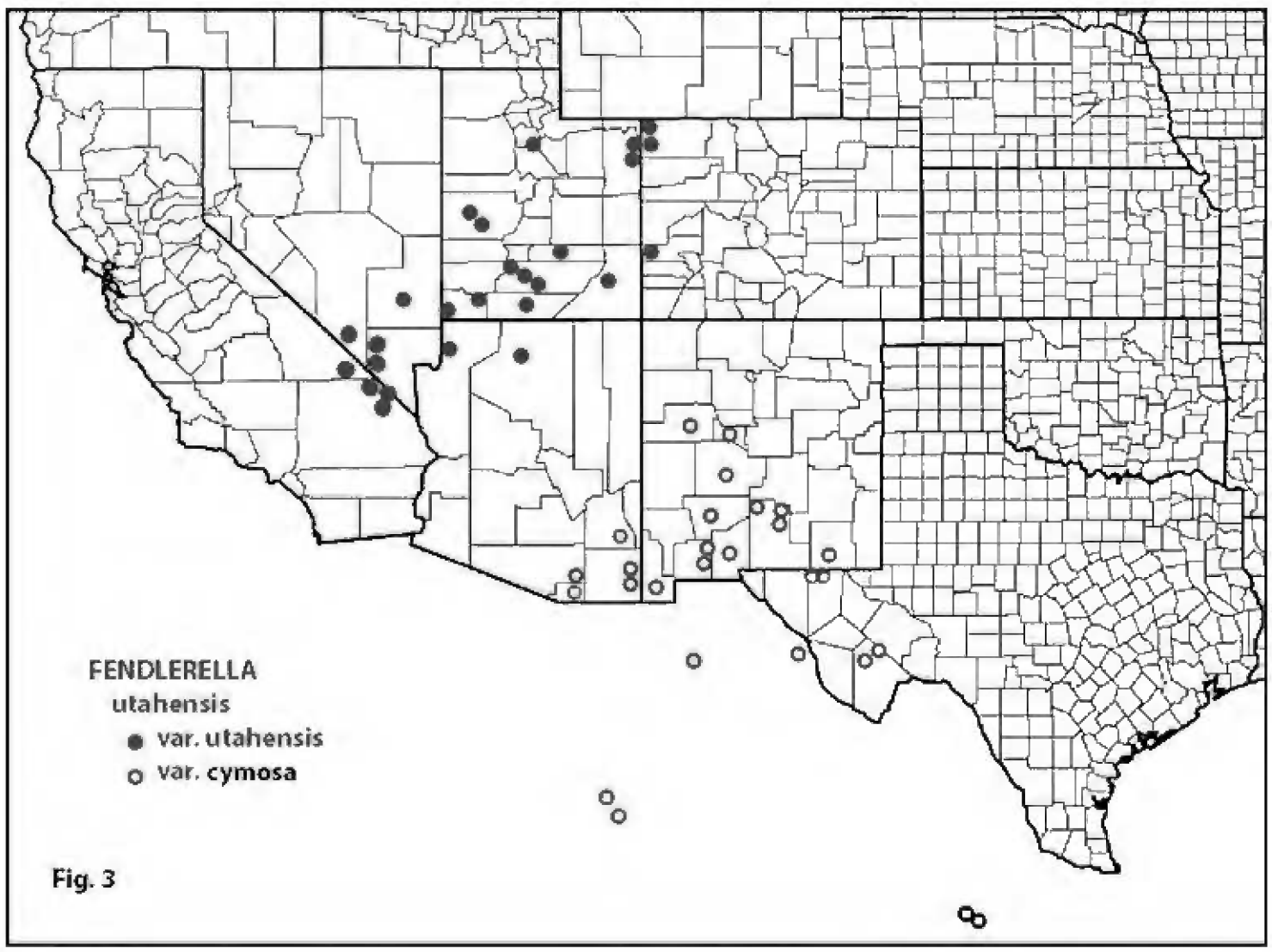

Fig. 3. Distribution of *Fendlerella utahensis*.